B. Specific Aims.

Cancers of the gastrointestinal tract, lung, and breast constitute mote than 590,000 of the 1.1 million new cases of cancer in the United States each year. Although progress has been made in the adjuvant treatment of early stage breast and colorectal cancer, there is still a need for more effective therapy for advanced malignant disease arising from each of these organ systems. A potential target for improved immunotherapy of some of these human adenocarcinomas is the tumor associated antigen, carcinoembryonic antigen (CEA). The Laboratory of Tumor Immunology and Biology at the NCI has taken a direct immunologic approach to CEA-bearing tumors by using inoculation with a recombinant vaccinia virus that expresses the human CEA gene (rV-CEA). Pre-clinical studies using rV-CEA have elicited a cellular and humoral response to the CEA peptide in both murine and primate models. Additionally, an early clinical trial has been able to demonstrate a secondary T-cell response towards CEA peptide post-vaccination. These findings support further studies using rV-CEA with follow-up *in vivo* CEA peptide stimulation. This schema is aimed at maximizing the immunological response by stimulating the CEA specific T-lymphocytes already shown to be present *in vivo* after rV-CEA challenge. The ability to establish a significant precursor tumor specific T-population could lead to an effective anti-tumor response. The specific aims of this phase I proposal, in collaboration with the Laboratory of Tumor Immunology and Biology at the NCI, are:

1. To determine tolerance/side effects of repeated vaccination with rV-CEA followed by repeated CEA peptide injection.

2. To determine the optimal biologic dose for CEA peptide injection following vaccination with rV-CEA as determined by demonstration of humoral and/or cellular immune response in the majority of patients per cohort

3. To assess any evidence of anti-tumor activity in patients receiving the treatment protocol.